

## CLAIMS

1. A color illumination device for producing light of various colors, comprising:

5 a plurality of color light sources for emitting lights of at least two different colors;

a control unit for controlling the plurality of color light sources;

10 a light mixing means for mixing the lights emitted from the plurality of color light sources to produce an illumination light; and

a control operable to change a value of a variable,

15 wherein the color illumination device has a first functional mode in which the value of the variable determines a color of the illumination light.

2. The color illumination device according to claim 1, wherein the color illumination device has a second

20 functional mode in which the color of the illumination light is changed periodically in a predetermined pattern and the value of the variable determines a cycle of the periodic light color change, and wherein the color illumination device further comprises a switch operable  
25 to select one of the functional modes of the color illumination device.

3. The color illumination device according to claim 2, wherein when the functional mode is changed from the second functional mode to the first functional mode by an operation of the switch, the illumination light color effected in the second functional mode at the time of the switch operation for the functional mode change is maintained in the first functional mode until the control is operated anew after the functional mode change.

4. The color illumination device according to claim 3, wherein the control unit comprises:

a memory for storing the color of the illumination light being produced; and

a detector for detecting an operation of the control.

5. The color illumination device according to claim 2, further having a third functional mode which is different from the first and second functional modes,

wherein the switch comprises two different states associated with the first and second functional modes, respectively and wherein in a case that the state of the switch is changed when the color illumination device is in the first functional mode and returned to an original state within a predetermined time period, the color illumination device enters the third functional mode.

6. The color illumination device according to claim 5,  
wherein in the third functional mode, the color  
illumination device repeatedly turns on and off at a  
predetermined cycle, and the value of the variable  
5 determines a duration time of the turning on of the  
color illumination device.

7. The color illumination device according to claim 1,  
wherein the plurality of color light sources comprise a  
10 red LED set having a series-connected plurality of red  
LEDs, a green LED set having a series-connected  
plurality of green LEDs, and a blue LED set having a  
series-connected plurality of blue LEDs, and wherein the  
control unit comprises a first, second and third  
15 switching elements each connected in series to an  
associated one of the red, green and blue LED sets, and  
a CPU for controlling the first, second and third  
switching elements.

20 8. The color illumination device according to claim 1,  
the light mixing means comprises a first light diffusing  
member and a second light diffusing member interposed  
between the first light diffusing member and the  
plurality of color light sources, the second light  
25 diffusing member having a light transmissive property.

9. The color illumination device according to claim 8, wherein the first light diffusing member comprises a cover having a light transmissive property.

5 10. A color illumination device for producing light of various colors, comprising:

a plurality of color light sources for emitting lights of at least two different colors;

10 a control unit for controlling the plurality of color light sources;

a light mixing means for mixing the lights emitted from the plurality of color light sources to produce an illumination light; and

a control operable by a user,

15 wherein the color illumination device has at least two functional modes and a function of the control is defined for each functional mode,

20 and wherein the color illumination device further comprises a switch operable to select one of the at least two functional modes.

11. The color illumination device according to claim 10, wherein the control is adapted to change a value of a variable, and the value of the variable is converted  
25 into an operation parameter defined for each of the functional modes.

12. The color illumination device according to claim 11, wherein the at least two functional modes comprise a first functional mode in which the value of the variable is converted into a color of the illumination light.

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13. The color illumination device according to claim 12, wherein the at least two functional modes comprise a second functional mode in which the color of the illumination light is changed periodically in a predetermined pattern, and the value of the variable is converted into a cycle of the periodic light color change.

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14. The color illumination device according to claim 10, wherein the switch is adapted to provide the control unit with a signal for indicating that the switch is operated, and in response to the signal from the switch, the control unit causes a current functional mode to switch to a next functional mode in a predetermined order of the functional modes.

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